

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

72. (Currently Amended) A tire comprising at least one structural element comprising a crosslinked elastomeric material, wherein said crosslinked elastomeric material is obtained by crosslinking a crosslinkable elastomeric composition comprising:

- (a) 100 phr of at least one diene elastomeric polymer;
- (b) 1 phr to 50 phr of at least one layered material having an individual layer thickness of 0.01 nm to 30 nm;
- (c) from 0.1 phr to 15 phr of at least one methylene donor compound; and
- (d) 0.4 phr to 20 phr of at least one methylene acceptor compound.

73. (Currently Amended) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises 2 phr to 40 phr of said at least one layered material.

74. (Currently Amended) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises 5 phr to 30 phr of said at least one layered material.

75. (Previously Presented) The tire according to claim 72, wherein said at least one layered material has an individual layer thickness of 0.05 nm to 15 nm.

76. (Currently Amended) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises 0.3 phr to 10 phr of said at least one methylene donor compound.

77. (Currently Amended) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises 0.8 phr to 15 phr of said at least one methylene acceptor compound.

78. (Currently Amended) The tire according to claim 72, comprising:
a carcass structure of a substantially toroidal shape, having opposite lateral edges associated with respective right-hand and left-hand bead structures, said bead structures comprising at least one bead core and at least one bead filler;
a belt structure applied in a radially external position with respect to said carcass structure;
a tread band radially superimposed on said belt structure;
a pair of sidewalls applied laterally on opposite sides with respect to said carcass structure; and
at least one structural element selected from bead filler, sidewall insert, tread underlayer, or tread base, obtained by crosslinking [[a]]said crosslinkable elastomeric composition comprising:
(a) 100-phr of at least one diene elastomeric polymer;
(b) 1 phr to 50-phr of at least one layered material having an individual layer thickness of 0.01 nm to 30 nm;

- (e) 0.1 phr to 15 phr of ~~at least one methylene donor compound~~; and
- (d) 0.4 phr to 20 phr ~~at least one methylene acceptor compound~~.

79. (Currently Amended) The tire according to claim 78, wherein said crosslinkable elastomeric composition comprises 2 phr to 40 phr of said at least one layered material.

80. (Currently Amended) The tire according to claim 78, wherein said crosslinkable elastomeric composition comprises 5 phr to 30 phr of said at least one layered material.

81. (Previously Presented) The tire according to claim 78, wherein said at least one layered material has an individual layer thickness of 0.05 nm to 15 nm.

82. (Currently Amended) The tire according to claim 78, wherein said crosslinkable elastomeric composition comprises 0.3 phr to 10 phr of said at least one methylene donor compound.

83. (Currently Amended) The tire according to claim 78, wherein said crosslinkable elastomeric composition comprises 0.8 phr to 15 phr of said at least one methylene acceptor compound.

84. (Currently Amended) The tire according to claim 78, wherein said at least one structural element includes a sidewall insert and a bead structure, said sidewall insert extends radially from a position corresponding to the bead structure to a position corresponding to a tread lateral edge.

85. (Currently Amended) The tire according to claim 78, wherein said at least one structural element includes a tread underlayer and a tread band, wherein said tread underlayer is a layer of crosslinked elastomeric composition applied in a radially internal position with respect to said tread band.

86. (Currently Amended) The tire according to claim 78, wherein said at least one structural element includes a tread band, wherein said tread band is of cap and base construction and comprises a radially inner layer or tread base and a radially outer layer or tread cap.

87. (Previously Presented) The tire according to claim 72, wherein said structural element has a dynamic elastic modulus, measured at 70°C, not lower than 5 MPa.

88. (Previously Presented) The tire according to claim 87, wherein said structural element has a dynamic elastic modulus, measured at 70°C, of 8 MPa to 80 MPa.

89. (Previously Presented) The tire according to claim 72, wherein said structural element has a tensile modulus at 100% elongation (100% Modulus) not lower than 3 MPa.

90. (Previously Presented) The tire according to claim 89, wherein said structural element has a tensile modulus at 100% elongation (100% Modulus) of 4 MPa to 20 MPa.

91. (Previously Presented) The tire according to claim 72, wherein said structural element has an IRHD hardness, measured at 23°C, not lower than 65.

92. (Previously Presented) The tire according to claim 91, wherein said structural element has an IRHD hardness, measured at 23°C, of 70 to 95.

93. (Previously Presented) The tire according to claim 72, wherein the diene elastomeric polymer has a glass transition temperature below 20°C.

94. (Previously Presented) The tire according to claim 93, wherein the diene elastomeric polymer is selected from: natural or synthetic cis-1,4-polyisoprene, 3,4-polyisoprene, polybutadiene, optionally halogenated isoprene/isobutene copolymers, 1,3-butadiene/acrylonitrile copolymers, styrene/1,3-butadiene copolymers,

styrene/isoprene/1,3-butadiene copolymers, styrene/1,3-butadiene/acrylonitrile copolymers, or mixtures thereof.

95. (Previously Presented) The tire according to claim 72, wherein the crosslinkable elastomeric composition comprises at least 10% by weight with respect to the total weight of the at least one diene elastomeric polymer of natural or synthetic cis-1, 4-polyisoprene.

96. (Previously Presented) The tire according to claim 95, wherein the crosslinkable elastomeric composition comprises 20% by weight to 100% by weight with respect to the total weight of the at least one diene elastomeric polymer of natural or synthetic cis-1,4-polyisoprene.

97. (Previously Presented) The tire according to claim 72, wherein the crosslinkable elastomeric composition further comprises at least one elastomeric polymer of one or more monoolefins with an olefinic comonomer or derivatives thereof.

98. (Previously Presented) The tire according to claim 97, wherein the elastomeric polymer is selected from: ethylene/propylene copolymers (EPR) or ethylene/propylene/diene copolymers (EPDM); polyisobutene; butyl rubbers; halobutyl rubbers; or mixtures thereof.

99. (Previously Presented) The tire according to claim 93, wherein the diene elastomeric polymer comprises at least one functional group selected from carboxylic groups, carboxylate groups, anhydride groups, ester groups, or epoxy groups.

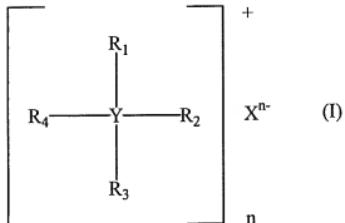
100. (Previously Presented) The tire according to claim 97, wherein the at least one elastomeric polymer comprises at least one functional group selected from carboxylic groups, carboxylate groups, anhydride groups, ester groups, or epoxy groups.

101. (Previously Presented) The tire according to claim 72, wherein said layered material is selected from: phyllosilicates, smectites, montmorillonite, bentonite, nontronite, beidellite, volkonskoite, laponite, hectorite, saponite, sauconite, magadite, kenyasite, stevensite, vermiculite, halloisite, sericite, aluminate oxides, hydrotalcite, or mixtures thereof.

102. (Previously Presented) The tire according to claim 101, wherein said layered material is montmorillonite.

103. (Previously Presented) The tire according to claim 72, wherein said layered material is treated with a compatibilizing agent.

104. (Previously Presented) The tire according to claim 103, wherein said compatibilizing agent is selected from the quaternary ammonium or phosphonium salts having general formula (I):



wherein:

Y represents N or P;

R₁, R₂, R₃ and R₄, which may be identical or different, represent a linear or branched C₁-C₂₀ alkyl or hydroxyalkyl group; a linear or branched C₁-C₂₀ alkenyl or hydroxyalkenyl group; a group -R₅-SH or -R₅-NH wherein R₅ represents a linear or branched C₁-C₂₀ alkylene group; a C₆-C₁₈ aryl group; a C₇-C₂₀ arylalkyl or alkylaryl group; a C₅-C₁₈ cycloalkyl group, said cycloalkyl group possibly containing a hetero atom such as oxygen, nitrogen or sulphur;

Xⁿ⁻ represents an anion, a chlorine ion, a sulphate ion or a phosphate ion; and

n represents 1, 2 or 3.

105. (Previously Presented) The tire according to claim 72, wherein the methylene donor compound is selected from: hexamethylenetetramine (HMT), hexamethoxymethylmelamine (HMMM), formaldehyde, paraformaldehyde, trioxane, 2-methyl-2-nitro-1-propanal, substituted melamine resins, N-substituted

oxymethylmelamine resins, glycoluril compounds, tetramethoxymethyl glycoluril, urea-formaldehyde resins, butylated urea-formaldehyde resins, or mixtures thereof.

106. (Previously Presented) The tire according to claim 105, wherein the methylene donor compound is hexamethylenetetramine (HMT) or hexamethoxymethylmelamine (HMMM).

107. (Previously Presented) The tire according to claim 72, wherein the methylene acceptor compound is selected from: resorcinol, catechol, hydroquinone, pyrogallol, phloroglucinol, 1-naphthol, 2 -naphthol, phenolic resins obtained from the condensation of an optionally substituted phenol with an aldehyde, formaldehyde, acetaldehyde, or furfural, or mixtures thereof.

108. (Previously Presented) The tire according to claim 107, wherein the methylene acceptor compound is resorcinol.

109. (Previously Presented) The tire according to claim 72, wherein said methylene donor compound and said methylene acceptor compound are added to the crosslinkable elastomeric composition in a precondensed form.

110. (Previously Presented) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises 0 phr to 120 phr of at least one carbon black reinforcing filler.

111. (Previously Presented) The tire according to claim 110, wherein said crosslinkable elastomeric composition comprises 20 phr to 90 phr of at least one carbon black reinforcing filler.

112. (Previously Presented) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises at least one silane coupling agent.

113. (Previously Presented) The tire according to claim 112, wherein said silane coupling agent is selected from a silane agent having at least one hydrolyzable silane group which may be identified by the following general formula (II)



wherein the groups R, which may be identical or different, are selected from: alkyl, alkoxy or aryloxy groups or from halogen atoms, on condition that at least one of the groups R is an alkoxy or aryloxy group; n is an integer of 1 to 6 inclusive; X is a group selected from: nitroso, mercapto, amino, epoxide, vinyl, imide, chloro, $-(S)_mC_nH_{2n}-Si-(R)_3$ or $-S-COR$ in which m and n are integers of 1 to 6 inclusive and the groups R are defined as above.

114. (Previously Presented) The tire according to claim 112, wherein said silane coupling agent is present in the crosslinkable elastomeric composition in an amount of 0 phr to 10 phr.

115. (Previously Presented) The tire according to claim 114, wherein said silane coupling agent is present in the crosslinkable elastomeric composition in an amount of 0.5 phr to 5 phr.

116. (Previously Presented) The tire according to claim 72, wherein said crosslinkable elastomeric composition comprises discontinuous fibers.

117. (Previously Presented) The tire according to claim 116, wherein said discontinuous fibres are aramid fibres.

118. (Previously Presented) The tire according to claim 117, wherein said aramid fibres are short fibrillated poly (paraphenylene-terephthalamide) fibres.

119. (Previously Presented) The tire according to claim 117, wherein said aramid fibres are predispersed in a polymer matrix selected from: natural rubber, butadiene/styrene copolymers, or ethylene/vinyl acetate copolymers.

120. (Previously Presented) The tire according to claim 119, wherein said polymer matrix is natural rubber.

121. (Previously Presented) The tire according to claim 72, wherein said discontinuous fibres are selected from: fibres based on other polyamides, on polyesters,

on polyolefins, on polyvinyl alcohol, glass fibres, natural fibres, cellulose, lignine, or mixtures thereof.

122. (Currently Amended) The tire according to claim[[s]] 116, wherein said discontinuous fibres are present in the crosslinkable elastomeric composition in an amount of 0 phr to 10 phr.

123. (Previously Presented) The tire according to claim 122, wherein said discontinuous fibres are present in an amount of 0.5 phr to 6 phr.

124. (Previously Presented) The tire according to claim 72, wherein at least one additional reinforcing filler is present in said crosslinkable elastomeric composition in an amount of 0 phr to 120 phr.

125. (Previously Presented) The tire according to claim 124, wherein said additional reinforcing filler is silica.

126. (Previously Presented) The tire according to claim 125, wherein at least one further silane coupling agent is present.

127. (Previously Presented) A crosslinkable elastomeric composition comprising:

- (a) at least one diene elastomeric polymer;

- (b) 1 phr to 50 phr of at least one layered material having an individual layer thickness of 0.01 nm to 30 nm.
- (c) 0.1 phr to 15 phr of at least one methylene donor compound; and
- (d) 0.4 phr to 20 phr of at least one methylene acceptor compound.

128. (Currently Amended) The crosslinkable elastomeric composition according to claim 127, comprising 2 phr to 40 phr of said at least one layered material.

129. (Currently Amended) The crosslinkable elastomeric composition according to claim 127, comprising 5 phr to 30 phr of said at least one layered material.

130. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said at least one layered material has an individual layer thickness of 0.05 nm to 15 nm.

131. (Currently Amended) The crosslinkable elastomeric composition according to claim 127, wherein said crosslinkable elastomeric composition comprises 0.3 phr to 10 phr of said at least one methylene donor compound.

132. (Currently Amended) The crosslinkable elastomeric composition according to claim 127, wherein said crosslinkable elastomeric composition comprises 0.8 phr to 15 phr of said at least one methylene acceptor compound.

133. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said diene elastomeric polymer has a glass transition temperature below 20°C, and is selected from: natural or synthetic cis-1,4-polyisoprene, 3,4-polyisoprene, polybutadiene, optionally halogenated isoprene/isobutene copolymers, 1,3-butadiene/acrylonitrile copolymers, styrene/1,3-butadiene copolymers, styrene/isoprene/1,3-butadiene copolymers, styrene/1,3-butadiene/acrylonitrile copolymers, or mixtures thereof.

134. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, further comprising at least one elastomeric polymer of one or more monoolefins with an olefinic comonomer or derivatives thereof.

135. (Previously Presented) The crosslinkable elastomeric composition according to claim 134, wherein the diene elastomeric polymer or the elastomeric polymer comprise at least one functional group selected from carboxylic groups, carboxylate groups, anhydride groups, ester groups, or epoxy groups

136. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein the layered material is selected from: phyllosilicates, smectites, montmorillonite, bentonite, nontronite, beidellite, volkonskoite, laponite, hectorite, saponite, sauconite, magadite, kenyasite, stevensite, vermiculite, halloisite, sericite, aluminate oxides, hydrotalcite, or mixtures thereof, and/or wherein said layered material is treated with a compatibilizing agent.

137. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein the methylene donor compound is selected from: hexamethylenetetramine (HMT), hexamethoxymethylmelamine (HMMM), formaldehyde, paraformaldehyde, trioxane, 2-methyl-2-nitro-1-propanal, substituted melamine resins, N-substituted oxymethylmelamine resins, glycoluril compounds, tetramethoxymethyl glycoluril, urea-formaldehyde resins, butylated urea-formaldehyde resins, or mixtures thereof.

138. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said methylene acceptor compound is selected from: resorcinol, catechol, hydroquinone, pyrogallol, phloroglucinol, 1-naphthol, 2 -naphthol, phenolic resins obtained from the condensation of an optionally substituted phenol with an aldehyde, formaldehyde, acetaldehyde, or furfural, or mixtures thereof.

139. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said methylene donor compound and said methylene acceptor compound are added in a precondensed form.

140. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said crosslinkable elastomeric composition comprises at least one carbon black reinforcing filler.

141. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein said crosslinkable elastomeric composition comprises at least one silane coupling agent.

142. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, wherein at least one additional reinforcing filler is present in an amount of 0 phr to 120 phr.

143. (Previously Presented) The crosslinkable elastomeric composition according to claim 142, wherein the additional reinforcing filler is silica.

144. (Previously Presented) The crosslinkable elastomeric composition according to claim 143, wherein at least one silane coupling agent is present.

145. (Previously Presented) The crosslinkable elastomeric composition according to claim 127, further comprising discontinuous fibres.

146. (Previously Presented) A crosslinked manufactured article obtained by crosslinking a crosslinkable elastomeric composition defined according to claim 127.